

1966 OPERATING SUMMARY

LAKEVIEW
water pollution
control plant

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S67
1966
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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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ONTARIO WATER RESOURCES COMMISSION

OFFICE OF THE GENERAL MANAGER

Members of the Lakeview Local Advisory Committee,
The Township of Toronto and the Municipality of
Metropolitan Toronto.

Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the
Lakeview Water Pollution Control Plant, OWRC Project No. 59-S-43.

It is hoped that our joint participation in efforts to combat water pollution
will have even more success in the coming year.

Yours very truly,

A handwritten signature in black ink, appearing to read "Caverly".

D. S. Caverly,
General Manager.

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NOV 23 1967

ONTARIO WATER
RESOURCES COMMISSION



ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

J. A. VANCE, LL.D.
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J. H. H. ROOT, M.P.P.
VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER

W. S. MACDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am happy to present you with the 1966 Operating Summary for the Lakeview Water Pollution Control Plant, OWRC Project No. 59-S-43.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

A handwritten signature in cursive script, appearing to read "B. C. Palmer".

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

• This operating summary contains complete information on the management of the project during 1967. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

CONTENTS

Foreword	1
Title Page	3
'66 Review	5
Project Costs	6
Operating Costs	8
Process Data	10

LAKEVIEW
water pollution control plant

operated for

THE TOWNSHIP OF TORONTO

and

THE MUNICIPALITY OF METROPOLITAN TORONTO

by

THE ONTARIO WATER RESOURCES COMMISSION

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DIVISION OF PLANT OPERATIONS

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Assistant Director:	C. W. Perry
Regional Supervisor:	A. C. Beattie
Operations Engineer:	A. Clark

801 Bay Street Toronto 5

'66 REVIEW

As in recent years, the quality of the final effluent did not meet Commission objectives of 15 ppm BOD and 15 ppm SS due to high flows. The plant operated over design capacity throughout 1966. The average daily flow was approximately 8 mgd.

Due to the high flows, only part of the flow was given complete treatment. The remainder was given primary treatment and chlorinated.

Due to construction of the plant extensions, full use of the sludge lagoons was not possible and liquid sludge haulage costs were high.

Experiments with the addition of polyelectrolytes to raw sewage were conducted. Results were sufficiently encouraging to allow further studies in 1967.

PROJECT STAFF

In 1966 the plant staff consisted of a superintendent, mechanic, mechanic's assistant, four operators and three labourers, a total complement of ten men. The plant is supervised 16 hours per day, seven days per week.

These same men also operate the satellite sewage pumping stations in Port Credit and the Township of Toronto.

Late in the year, arrangements were made to increase staff in preparation for the plant enlargement. Completion of the enlargement is expected in the spring of 1967.

MAINTENANCE

Problems were routine. Equipment is in sound mechanical condition. However, maintenance was at least one month behind the schedule set up by the head office maintenance section. An increase in maintenance staff is planned in 1967. This is due in part to the near-completion of the plant extension.

There were no recorded visits to the plant by the special services section.

PROJECT COSTS

NET CAPITAL COST (Final)

Metro Toronto	\$1,401,180.66	
Toronto Twp.	<u>482,574.34</u>	\$1,883.755.00

Deduct portion-financed by		
CMHC (Final--Metro only)	<u>185,877.58</u>	

LONG TERM DEBT TO OWRC	<u>\$1,697,877.42</u>	
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Debt Retirement Balance at Credit (Sinking Fund) December 31, 1966

Metro Toronto	\$ 146,121.37	
Toronto Twp.	<u>57,742.33</u>	

	<u>\$203,863.70</u>	
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The total cost to the municipalities during 1966 was as follows:

Net Operating

Metro Toronto	\$ 99,798.79	
Toronto Twp.	<u>51,171.71</u>	\$156,970.50

Debt Retirement

Metro Toronto	\$ 24,525.00	
Toronto Twp.	<u>9,738.00</u>	\$ 34,263.00

Reserve

Metro Toronto	\$ 7,742.40	
Toronto Twp.	<u>2,514.05</u>	\$ 10,256.45

Interest Charged

Metro Toronto	\$ 68,375.99	
Toronto Twp.	<u>27,150.56</u>	\$ 95,526.55

TOTAL	<u>\$297,016.50</u>	
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RESERVE ACCOUNT

Balance at January 1, 1965

Metro Toronto	\$ 41,129.07
Toronto Twp.	<u>13,974.69</u>
	\$ 55,103.76

Deposited by Municipalities

Metro Toronto	\$ 7,742.40
Toronto Twp.	<u>2,514.05</u>
	\$ 10,256.45

Interest Earned

Metro Toronto	\$ 2,364.82
Toronto Twp.	<u>791.21</u>
	\$ 3,156.03
	—————
	\$ 68,516.24

Less Expenditures

Metro Toronto	\$ 3,310.65
Toronto Twp.	<u>1,418.85</u>
	\$ 4,729.50

Balance at December 31, 1966 \$ 63,786.74

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDAY	WATER
JAN	8458.10	4114.07				50.27	103.47	45.38	202.94	3895.80	46.17
FEB	10251.86	4060.85			1665.63		386.36	295.31	155.85	3642.86	45.00
MARCH	11620.64	3973.36			1569.31	1808.63	249.92	578.14	270.13	3241.15	
APRIL	13774.56	6737.54			1502.85	1133.38	389.20	160.02	376.02	3389.33	86.22
MAY	21800.32	4180.38	172.40	90.90	1508.32	896.70	331.90	1037.66	410.51	13124.12	47.43
JUNE	12203.50	4756.63	246.42		1520.10	896.70	254.59	113.71	227.82	4068.11	143.42
JULY	10917.57	4171.96	373.06	21.10	1630.25	1152.90	384.87	(839.19)	506.13	3472.34	39.15
AUG	13018.69	3717.66	312.40		1539.60	2498.85	423.93	85.14	83.24	4295.95	61.92
SEPT	12899.27	6195.35	494.04		1541.15		257.46	58.28	270.46	4082.53	
OCT	12085.61	3953.94	292.39		1702.43		229.66	57.31	462.52	5268.94	98.42
NOV	13057.41	3616.00	295.95		1667.19	1793.40	327.41	375.35	403.99	4311.74	65.88
DEC	15752.97	3555.15		7.56	3251.54	1793.40	779.59	3.64	1092.27	6203.88	55.94
TOTAL	156970.50	50272.89	2191.65	119.56	19114.37	12024.23	4118.36	1981.25	4461.68	58996.75	689.55

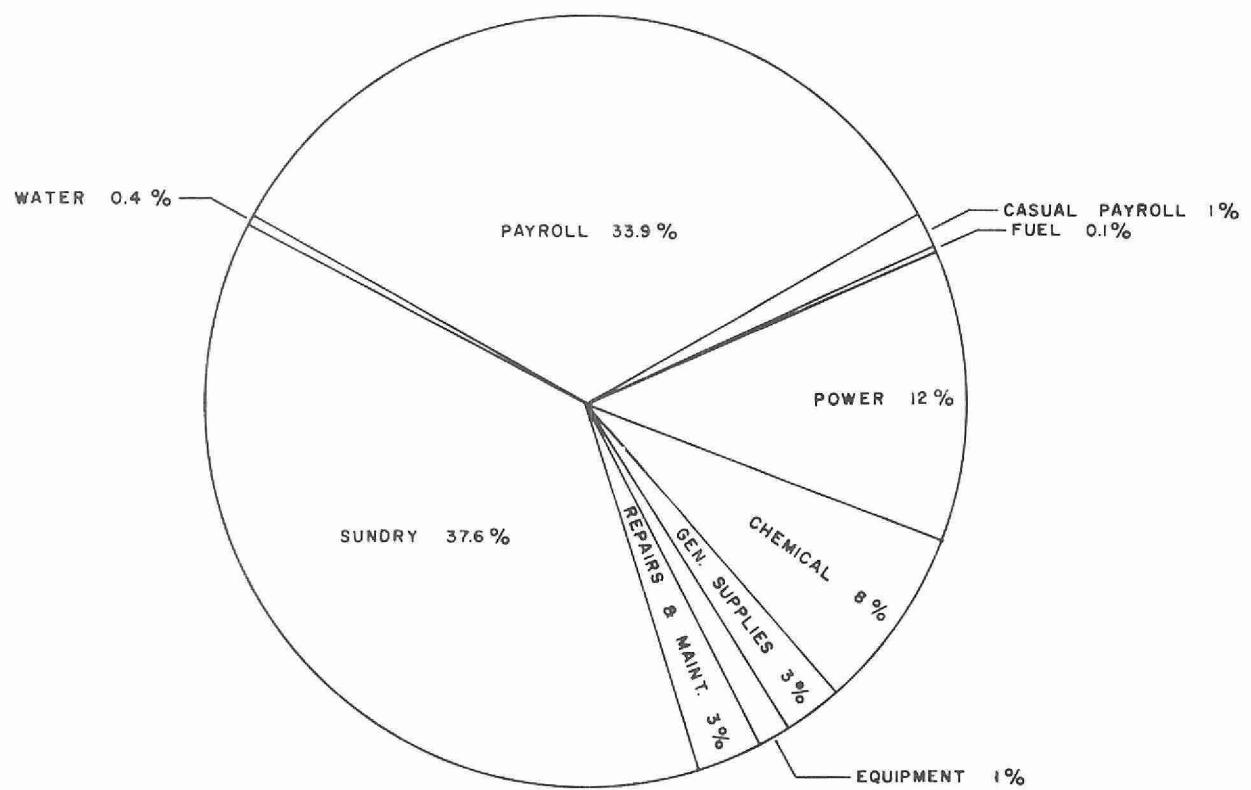
* SUNDAY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$49,861.32

BRACKETS INDICATE CREDIT

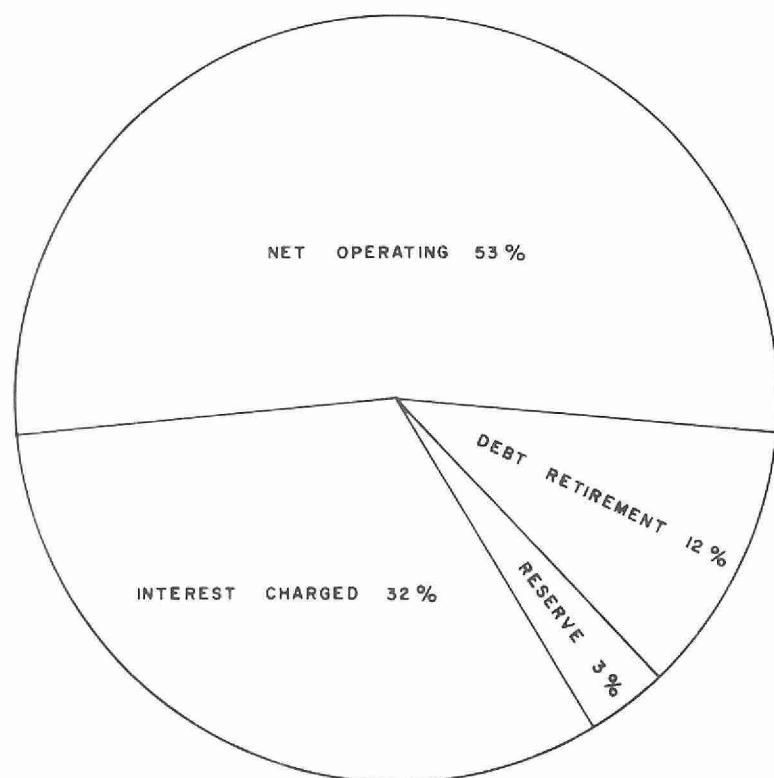
YEARLY OPERATING COSTS

YEAR	M.G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB. OF BOD REMOVED
1962	740,900	\$ 73998.00	\$ 99.87	7 CENTS
1963	1209,400	\$118027.00	\$ 98.00	5 CENTS
1964	2358,700	\$159678.00	\$ 67.59	3 CENTS
1965	2623,254	\$140366.45	\$ 53.51	2 CENTS
1966	2907,316	\$156970.50	\$ 53.99	3 CENTS

1966 OPERATING COSTS



TOTAL ANNUAL COST



Process Data

FLOWS

It can be seen from the table that the flow from Metropolitan Toronto was 1830.84 mg, an increase of 24.5% over 1965. The flow from the Township of Toronto was 918.02 mg, a decrease of approximately 4% from 1965. The flow from the Town of Port Credit was 158.5 mg, a decrease of 20% from 1965.

PROBABILITY OF FLOWS

The plot demonstrates that the plant was overloaded practically all the time in 1966 and that 6% of the time the daily flow exceeded twice the plant capacity of 5 mgd.

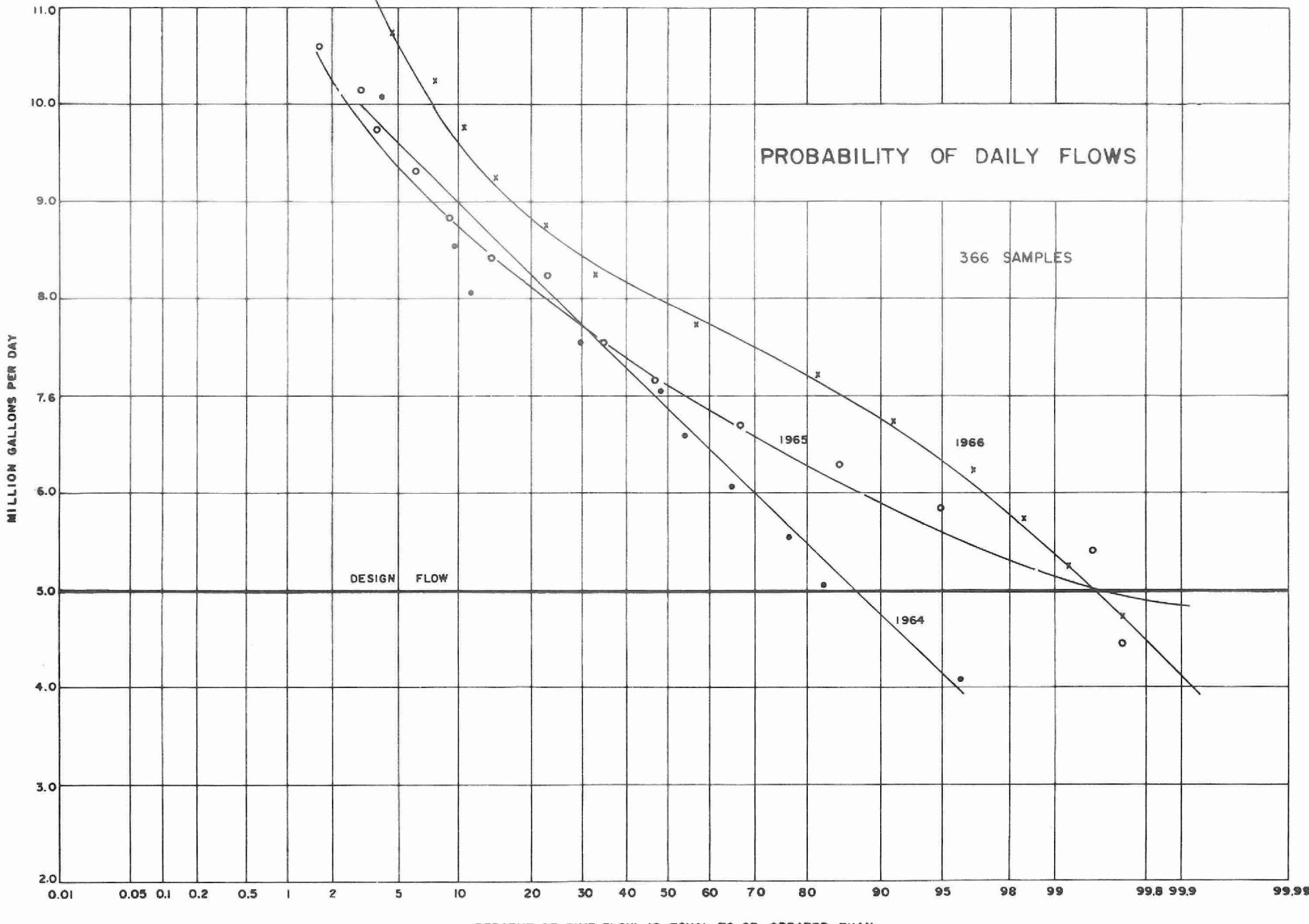
OPERATING RESULTS

At no time during the year were the Commission objectives of 15 ppm BOD and suspended solids for effluent quality met.

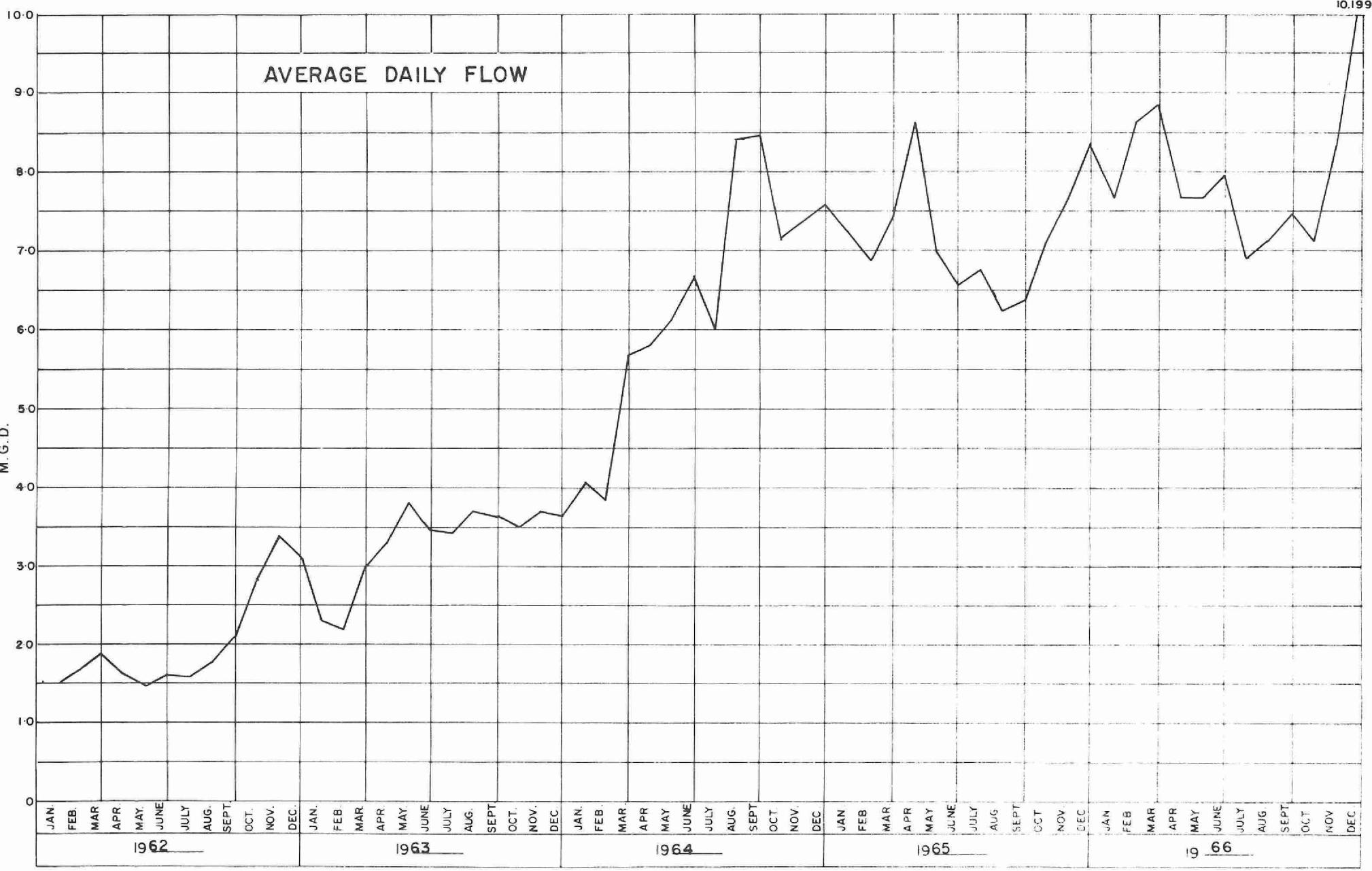
MONTH	METROPOLITAN TORONTO MG	TORONTO TOWNSHIP MG	PORT CREDIT MG	TOTAL PLANT MG
JANUARY	144.489	78.979	13.635	237.103
FEBRUARY	149.604	78.986	12.928	241.518
MARCH	170.903	84.904	19.641	275.448
APRIL	146.163	68.086	14.859	229.108
MAY	148.744	74.703	14.140	237.587
JUNE	155.606	70.221	13.486	239.313
JULY	134.447	69.193	11.637	215.277
AUGUST	138.326	71.342	11.588	221.256
SEPTEMBER	147.595	68.051	8.441	224.087
OCTOBER	138.473	71.751	10.437	220.661
NOVEMBER	158.682	79.888	11.220	249.790
DECEMBER	197.772	101.914	16.482	316.168
TOTAL	1830.804	918.018	158.494	2907.316

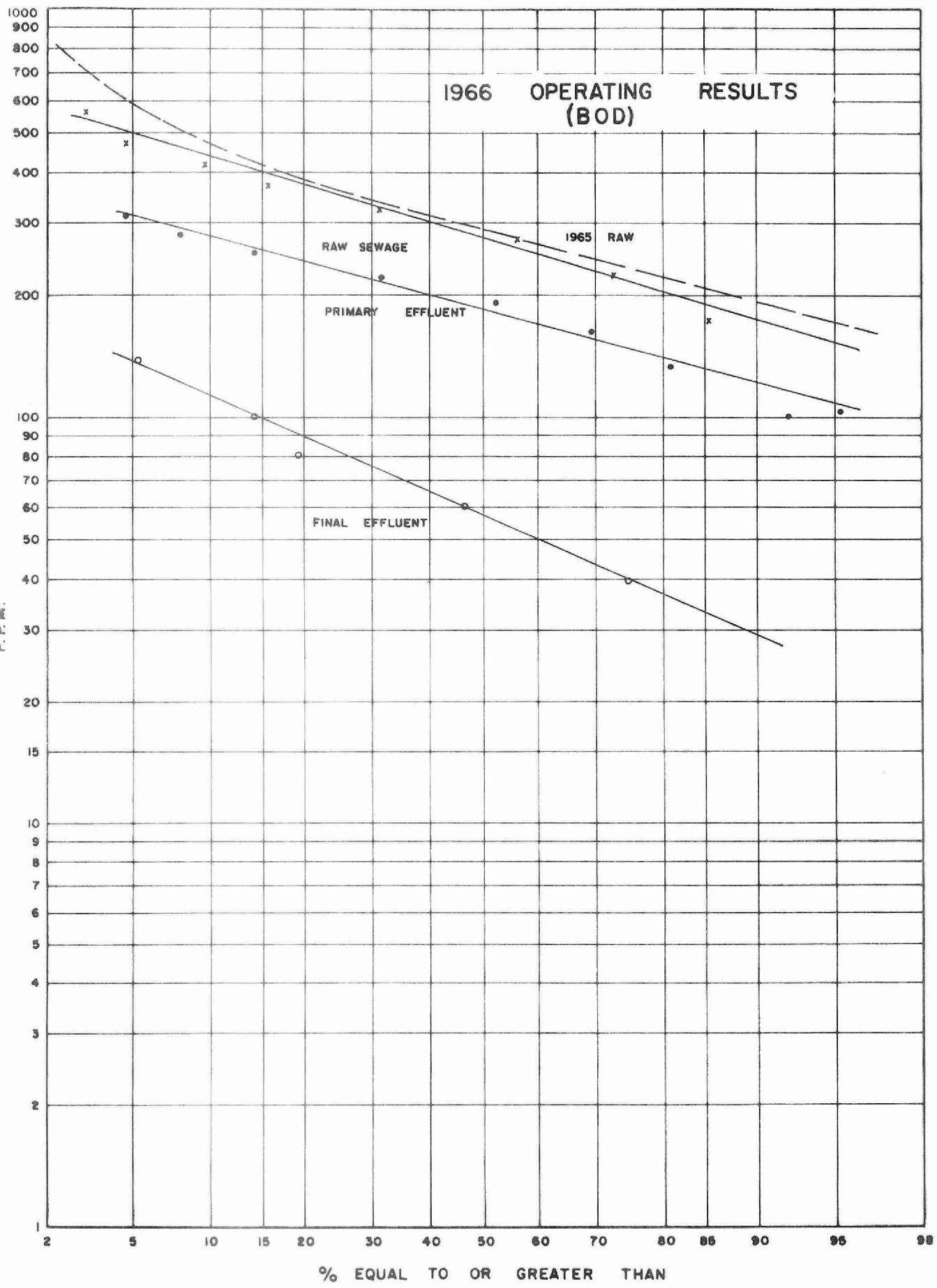
PERCENT 63.0 31.6 5.4 100.0

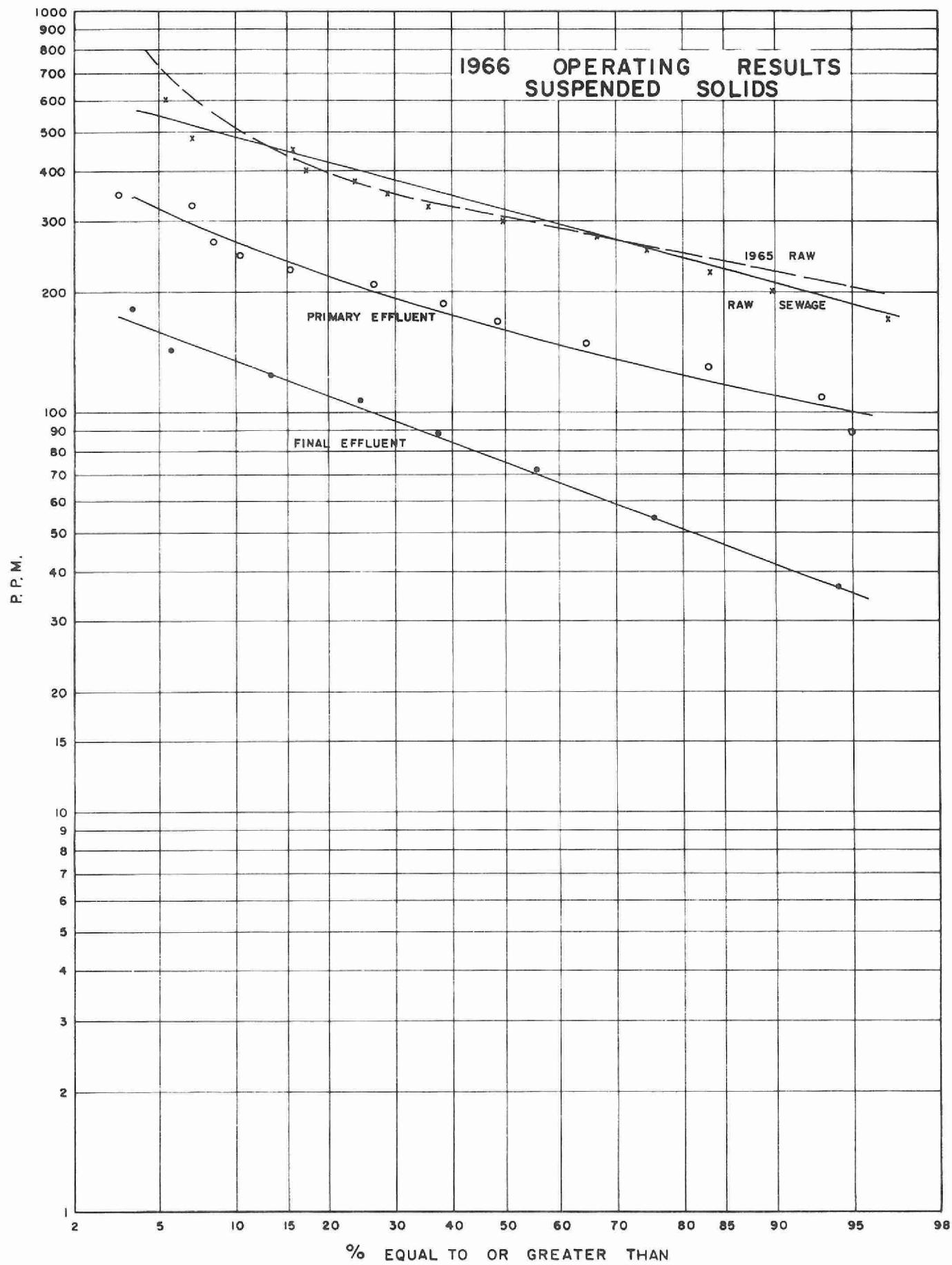
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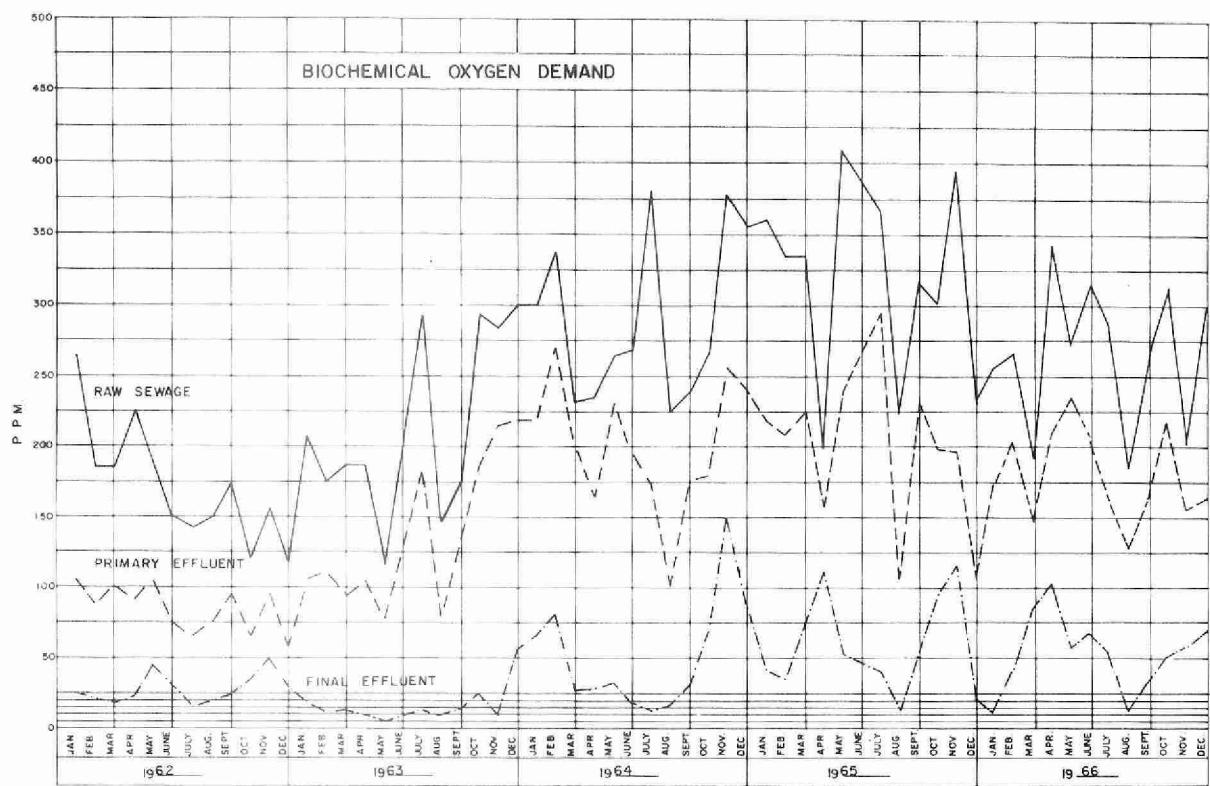


PERCENT OF TIME FLOW IS EQUAL TO OR GREATER THAN

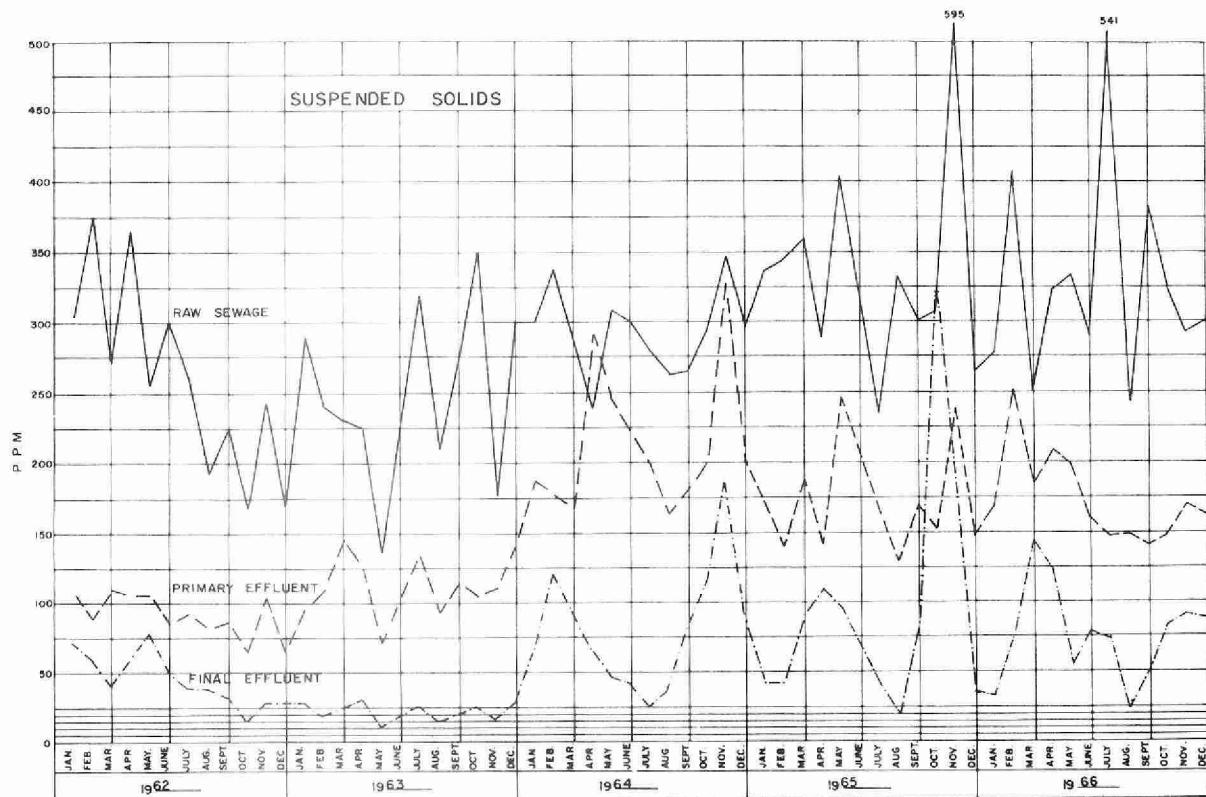








MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

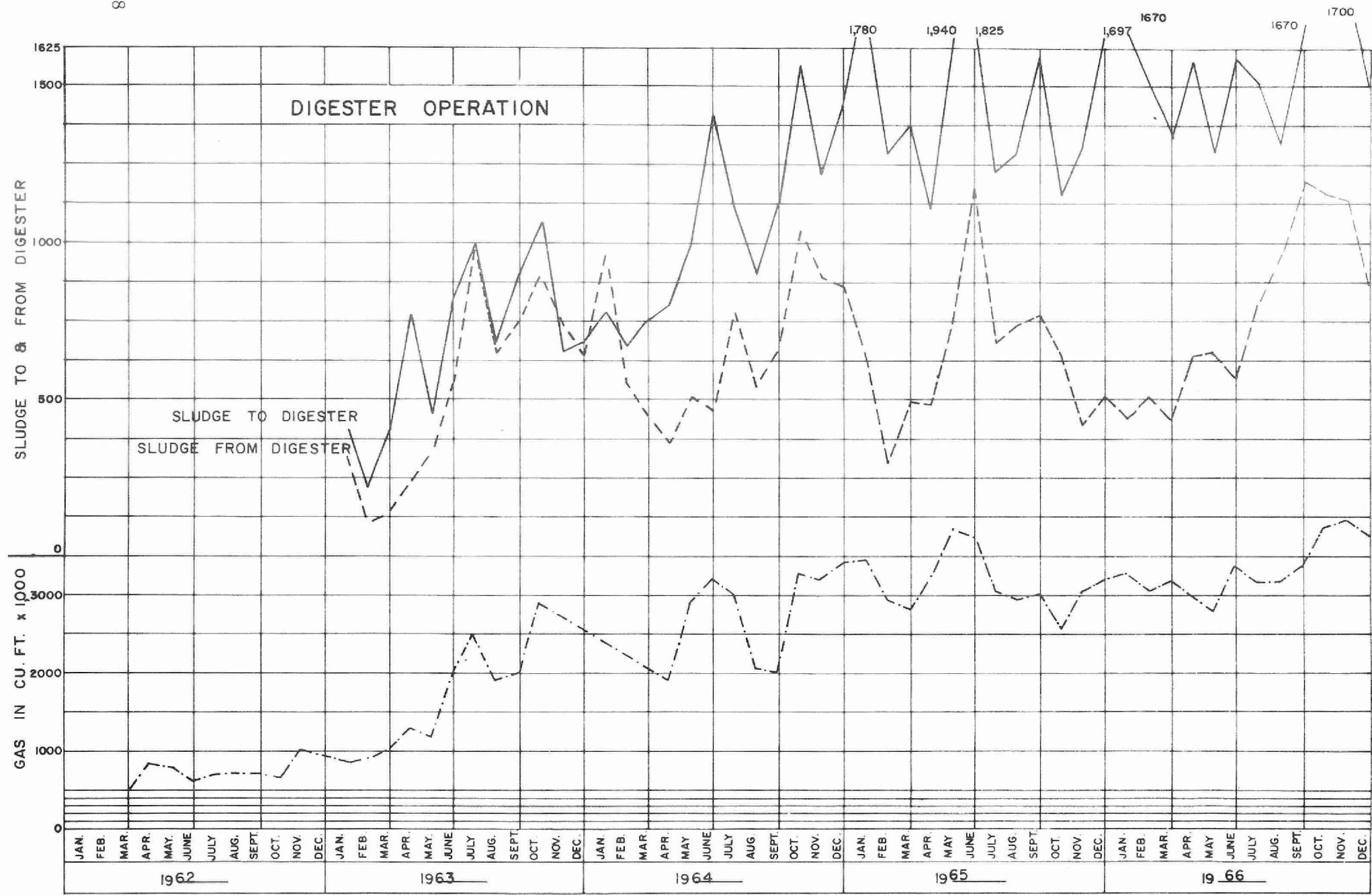
Lake

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	257	12	95.5	290.4	279	31	89.0	294.0	30
FEB.	265	40	85.0	271.7	408	72	82.5	405.8	97
MAR.	194	83	57.0	152.9	249	120	52.0	177.7	70
APR.	345	102	70.5	278.4	323	96	70.5	260.0	37
MAY	274	59	78.5	255.4	332	56	83.1	327.9	55
JUNE	315	67	78.5	296.7	288	79	72.5	250.1	90
JULY	285	54	81.0	248.6	541	73	86.5	503.7	80
AUG.	185	11	94.0	192.5	243	20	92.0	246.7	-
SEPT.	257	33	87.0	251.1	381	49	87.0	372.0	45
OCT.	309	50	84.0	285.8	324	83	74.5	265.9	60
NOV.	203	57	72.0	182.3	292	90	69.0	252.3	120
DEC.	298	66	78.0	366.8	300	88	70.5	335.1	120
TOTAL	-	-	-	3096.3	-	-	-	3765.0	804
AVG.	266	53	80.0	258.0	330	71	78.5	313.0	67

Table calculated on total project flow and combined effluent values used.

COMMENTS

There were no major operating difficulties in 1966. Plant loadings were high. A substantial part of the loading is from industry, and during part of August, when industry shut down for vacation, favourable results were obtained.

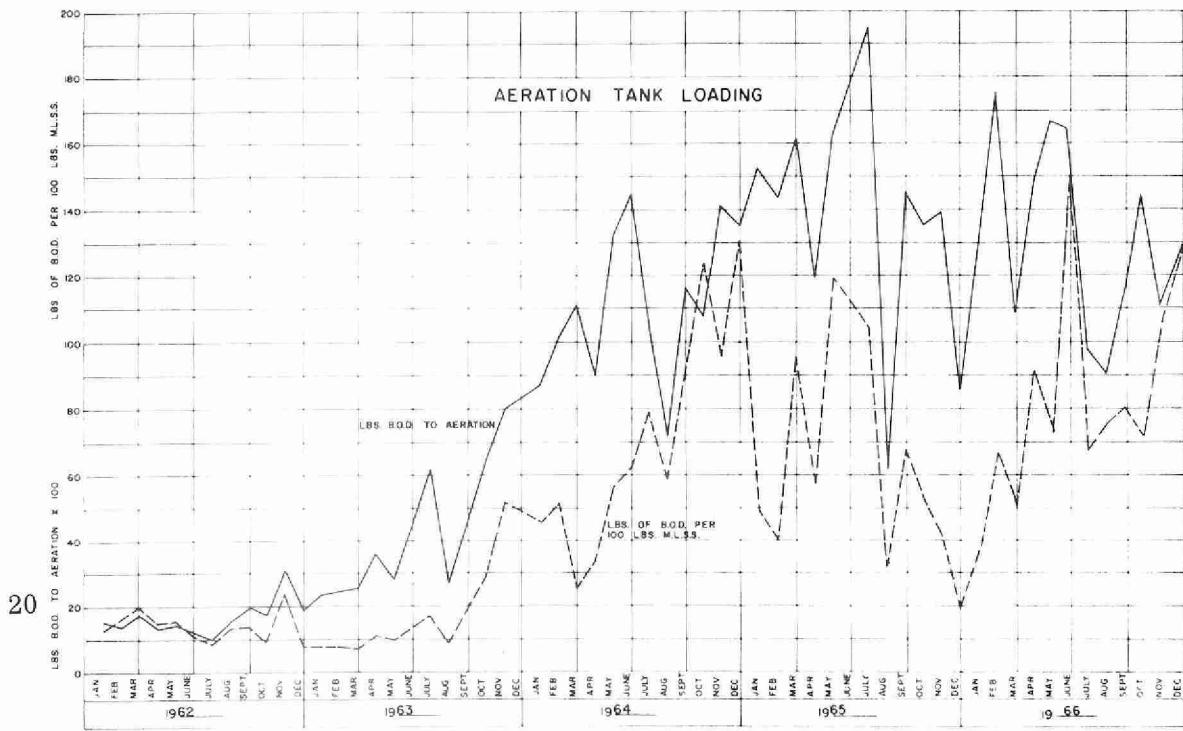
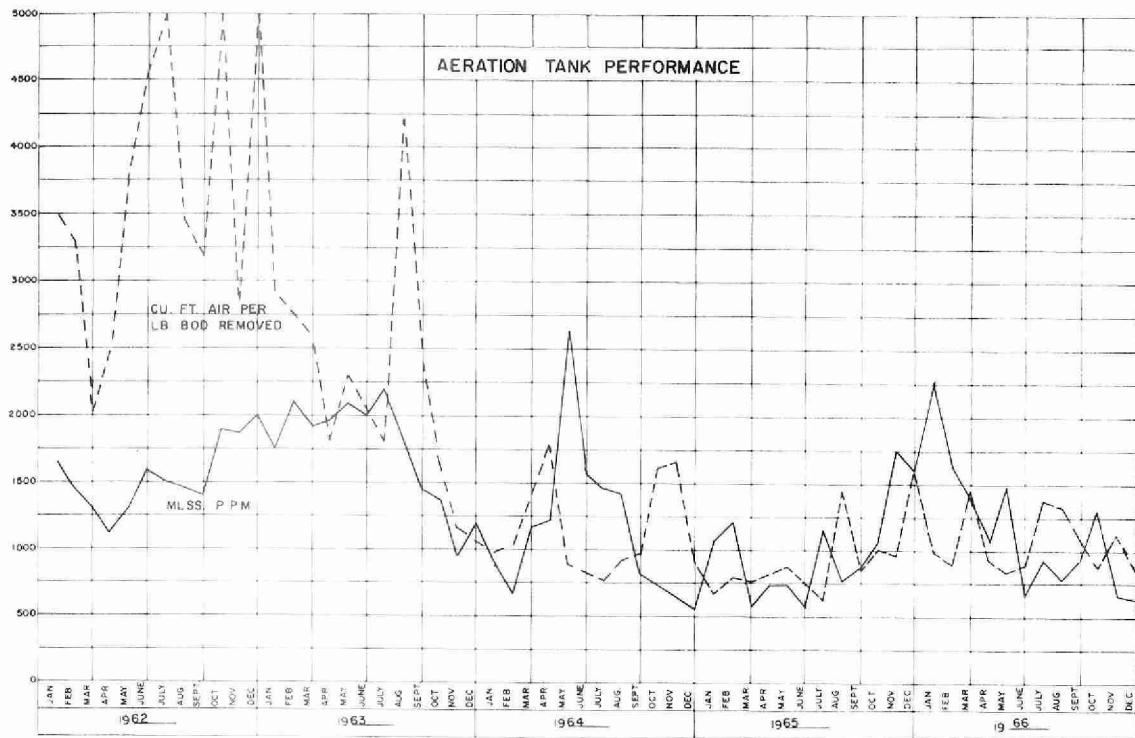


DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS			GAS PRODUCED 1000'S Cu. Ft.
	1000'S CU FT.	% SOLIDS	% VOL. MAT.	1000'S CU. FT.	% SOLIDS	% VOL. MAT	
JAN	267.71	5.92	3.41	71.50	6.75	3.33	3245.58
FEB.	244.23	5.93	3.64	82.64	6.70	3.02	3029.65
MAR.	217.16	5.62	3.63	69.95	5.46	2.66	3157.30
APR.	253.83	4.73	2.92	102.01	4.74	2.32	2990.94
MAY	205.65	5.20	3.53	104.28	5.06	2.26	2792.20
JUNE	251.82	5.40	3.51	91.72	4.48	2.16	3341.03
JULY	243.17	4.46	3.03	31.25	4.24	2.11	3139.40
AUG.	228.54	4.88	3.23	104.90	3.70	1.96	3151.70
SEPT.	268.27	6.44	4.12	162.14	4.86	2.55	3324.20
OCT.	285.14	6.44	4.06	186.02	4.62	2.22	3894.60
NOV.	272.31	5.84	3.65	182.67	3.40	1.69	3923.90
DEC.	250.10	5.69	3.50	136.21	3.97	1.80	3760.70
TOTAL	2770.77	-	-	1325.29	-	-	39751.20
AVG.	230.99	5.55	3.52	110.44	4.83	2.34	3312.60

COMMENTS

A total of 2,770,770 cubic feet of raw sludge at an average solids concentration of 5.55% was pumped to the digesters. Of this amount 1,325,290 cubic feet were removed after digestion. This is a reduction of volume of 52%. There was 6% reduction of volatile matter. This is shown in the high gas production of 12.5 cubic feet of raw sludge, or 6 cubic feet of gas per pound of volatile matter added.



AERATION SECTION

MONTH	PRIM. EFFL B.O.D. PPM.	MLSS. PPM.	LBS. BOD. PER 100 LBS. M.L.S.S.	CUBIC FEET AIR PER LB. BOD. REMOVED
JANUARY	173	2285	37	982
FEBRUARY	202	1610	66	899
MARCH	149	1389	50	1458
APRIL	219	1060	90	834
MAY	236	1481	72	836
JUNE	208	701	150	885
JULY	162	935	67	1360
AUGUST	129	765	75	1314
SEPTEMBER	162	914	80	1089
OCTOBER	220	1303	71	883
NOVEMBER	155	679	104	1117
DECEMBER	162	642	125	800
TOTAL	-	-	-	-
AVERAGE	181	1147	82	1038

COMMENTS

The ratio of pounds of BOD per 100 lbs. MLSS is 82. This value is high and is indicative of overloading. A more normal ratio would be 30, but this would require too many solids to be carried in the aeration section. Air supply is the limiting factor and it can be seen that the cu. ft. of air per lb. of BOD removed is 1038. This is a normal figure.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	237.103	15655	6.60
FEBRUARY	241.518	17950	7.43
MARCH	275.448	21310	7.74
APRIL	229.108	18530	8.09
MAY	237.587	19250	8.10
JUNE	239.313	17610	7.36
JULY	215.277	15370	7.14
AUGUST	221.256	9600	4.34
SEPTEMBER	224.087	11650	5.20
OCTOBER	220.661	13430	6.09
NOVEMBER	249.790	16440	6.58
DECEMBER	316.168	18770	5.94
TOTAL	2907.316	195565	-
AVERAGE	242.276	16297	6.73

COMMENTS

The plant effluent is chlorinated 365 days per year. In 1966, 2,907.316 million gallons of effluent were dosed by 195,565 lbs. of chlorine at an average dosage of 7 ppm.



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CONCLUSIONS

Flows in 1966 increased over 1965 by 11% although the recorded strength of the raw sewage showed a reduction of 16%. This may be due to improved sampling techniques.

Little use was made of the digested sludge lagoons because of construction.

RECOMMENDATIONS

The next plant enlargement should be implemented so that an effluent which meets Commission objects can be achieved.

